

CLAIMS

1. A method for fabricating an LED lamp, the method comprising the steps of:

(a) preparing a substrate with at least one LED chip mounted thereon;

(b) forming a phosphor resin portion on the substrate such that the LED chip is covered with the phosphor resin portion; and

(c) arranging a lens that acts on the outgoing light of the phosphor resin portion,

wherein the method further comprises the step of

(d) forming an optical diffusion layer, in which particles to scatter the outgoing light of the phosphor resin portion are dispersed, between the phosphor resin portion and the lens.

2. The method of claim 1, wherein the optical diffusion layer is made of a light-transmissive resin in which the particles are dispersed.

3. The method of claim 2, wherein the phosphor resin portion has a cylindrical shape.

4. The method of claim 3, wherein the step (c) includes forming the optical diffusion layer that has a substantially uniform thickness over a surface of the phosphor resin portion.

5. The method of claim 1, wherein the optical diffusion layer has a thickness of 10 μm to 1 mm.

6. The method of claim 1, further comprising the step of increasing the thickness of the optical diffusion layer on the upper surface of the phosphor resin portion from around the center of the upper surface toward the periphery of the upper surface.

7. The method of claim 2, wherein the particles are made of at least one material selected from the group consisting of SiO_2 , MgO , BaSO_4 and Al_2O_3 .

8. The method of claim 1, wherein the LED chip is a bare chip LED, which has been flip-chip bonded onto the substrate.

9. The method of claim 1, wherein the steps (b) and (d) are performed by a printing technique.

10. An LED lamp comprising:

at least one LED chip that is mounted on a substrate;

a phosphor resin portion that covers the LED chip;

a lens to act on the outgoing light of the phosphor resin portion; and

an optical diffusion layer, which is arranged between the phosphor resin portion and the lens and in which particles to scatter the light are dispersed.

11. The LED lamp of claim 10, wherein the phosphor resin portion includes a phosphor for converting the emission of the LED chip into light that has a longer wavelength than the emission, and

wherein the optical diffusion layer is made of a light-

transmissive resin in which the particles are dispersed.

12. The LED lamp of claim 10, wherein the optical diffusion layer covers at least the periphery of the upper surface of the phosphor resin portion.

13. The LED lamp of claim 10, wherein the phosphor resin portion has a cylindrical shape.

14. The LED lamp of claim 10, wherein the optical diffusion layer covers a surface of the phosphor resin portion and has a substantially uniform thickness.

15. The LED lamp of claim 10, further comprising a reflector, which has an opening to store the light-transmissive resin portion therein, on the substrate,

wherein a side surface defining the opening functions as a reflective surface for reflecting the emission of the LED chip.

16. The LED lamp of claim 15, wherein the reflective

surface is spaced apart from a side surface of the light-transmissive resin portion.